Claims:

1. A method for the identification of unknown particles contained in a fluid comprising:

a) providing a source of radiation and at least one detection means to detect said radiation located in a predetermined position relative to the radiation source, positioned to investigate a fluid;

b) interrogating said fluid with said source of radiation;

c) measuring the radiation scattered by an unknown particle in the fluid at said at least one detection means;

d) comparing the results obtained in step (c) with standard results previously obtained from a previously identified particle, wherein said standard results are obtained by generating a radiation scattering pattern capable of uniquely identifying said previously identified particle; and

e) identifying said unknown particle based upon the comparison of step (d).

2. The method of claim 1 wherein the radiation scattering pattern capable of uniquely identifying said previously identified particle was generated by subjecting measurements of the radiation scattered by said previously identified particle in a fluid to an algorithm which enhances the separation of data generated from said measurements from data generated from measurements of distinct particles.

3. The method of claim 2 wherein said algorithm is multiple analysis of variance.

4. The method of claim 2 further comprising subjecting the data obtained from said algorithm to a mathematical technique that further enhances the separation of data generated from said measurements from data generated from said measurements of distinct particles.

5. The method of claim 4 wherein said mathematical technique eliminates the data generated from a selected, previously identified particle unless the selected, previously identified particle is of the same type as the **N** particles whose generated data is most similar to the selected, previously identified particle's data, where **N** is a whole number greater than 0.

6. The method of claim 1 wherein the source of radiation is a source of electromagnetic radiation.

7. The method of claim 6 wherein the source of electromagnetic radiation is a laser.

8. The method of claim 1 wherein the detection means comprises a plurality of separate detectors arranged in predetermined positions relative to the radiation source.

9. The method of claim 6 wherein the detection means comprises at least one photodetector and a computer operatively connected to said photodetector.

10. The method of claim 1 wherein the fluid is liquid water.

11. The method of claim 1 wherein the particle is a microorganism.

12. The method of claim 11 wherein the microorganism is a member selected from the group consisting of *Cryptosporidium* spp. and *Giardia* spp.

09529497 .080301

13. A method for the identification of unknown particles contained in a fluid comprising:

a) providing a source of radiation and at least one detection means to detect said radiation located in a predetermined position relative to the radiation source, positioned to investigate a fluid

b) interrogating said fluid with said source of radiation;

c) measuring the radiation scattered by an unknown particle in the fluid at said at least one detection means;

d) comparing the results obtained in step (c) with standard results previously obtained from a previously identified particle, wherein said standard results are obtained by

i) generating a radiation scattering pattern capable of uniquely identifying said previously identified particle by subjecting measurements of the radiation scattered by said previously identified particle in a fluid to an algorithm which enhances the separation of data generated from said measurements from data generated from measurements of distinct particles; and

e) identifying said unknown particle based upon the comparison of step (d).

14. The method of claim 13 wherein said algorithm is multiple analysis of variance.

15. A method for the identification of unknown particles contained in a fluid comprising:

a) providing a source of radiation and at least one detection means to detect said radiation located in a predetermined position relative to the radiation source, positioned to investigate a fluid;

b) interrogating said fluid with said source of radiation;

c) measuring the radiation scattered by an unknown particle in the fluid at said at least one detection means;

d) comparing the results obtained in step (c) with standard results previously obtained from a previously identified particle, wherein said standard results are obtained by

i) generating a radiation scattering pattern capable of uniquely identifying said previously identified particle by subjecting measurements of the radiation scattered by said previously identified particle in a fluid to an algorithm which enhances the separation of data generated from said measurements from data generated from measurements of distinct particles, and

ii) subjecting the data obtained from said algorithm to a mathematical technique that eliminates the data generated from a selected, previously identified particle unless the selected, previously identified particle is of the same type as the **N** particles whose generated data is most similar to the selected, previously identified particle's data, where **N** is a whole number greater than 0; and

e) identifying said unknown particle based upon the comparison of step (d).

10983027.062601

16. A method for the identification of unknown particles contained in a fluid to be analyzed, wherein such analysis includes providing a source of radiation and at least one detection means having a plurality of separate detectors to detect said radiation located in a predetermined position relative to the radiation source, interrogating the fluid with the source of radiation, and measuring the radiation scattered by an unknown particle in the fluid by said detection means, the improvement comprising comparing the results obtained by said measurement step with standard results previously obtained from a previously identified particle, wherein said standard results are obtained by generating a radiation scattering pattern capable of uniquely identifying said previously identified particle, and identifying said unknown particle based upon the comparison step.

17. The method of claim 16 wherein the radiation scattering pattern capable of uniquely identifying said previously identified particle was generated by subjecting measurements of the radiation scattered by said previously identified particle in a fluid to an algorithm which enhances the separation of data generated from said measurements from data generated from measurements of distinct particles.

18. The method of claim 17 wherein said algorithm is multiple analysis of variance.

19. The method of claim 17 further comprising subjecting the data obtained from said algorithm to a mathematical technique that further enhances the separation of data generated from said measurements from data generated from said measurements of distinct particles.

20. The method of claim 19 wherein said mathematical technique eliminates the data generated from a selected, previously identified particle unless the selected, previously identified particle is of the same type as the **N** particles whose generated data is most similar to the selected, previously identified particle's data, where **N** is a whole number greater than 0.

21. The method of claim 16 wherein the source of radiation is a source of electromagnetic radiation.

22. The method of claim 21 wherein the source of electromagnetic radiation is a laser.

23. The method of claim 16 wherein the detection means comprises a plurality of separate detectors arranged in predetermined positions relative to the radiation source.

24. The method of claim 21 wherein the detection means comprises at least one photodetector and a computer operatively connected to said photodetector.

25. The method of claim 16 wherein the fluid is liquid water.

26. The method of claim 16 wherein the particle is a microorganism.

27. The method of claim 26 wherein the microorganism is a member selected from the group consisting of *Cryptosporidium* spp. and *Giardia* spp.

28. Apparatus for the identification of unknown particles contained in a fluid to be analyzed which includes a source of radiation for generating a radiation beam and at least one detection means having a plurality of separate detectors to detect said radiation located in a predetermined position relative to the radiation source, such that a particle intersecting the radiation beam will scatter radiation detectable by the detectors, and means for measuring the radiation scattered by an unknown particle in the fluid by said detection means, the improvement comprising means for comparing the results obtained by said measurement step with standard results previously obtained from a previously identified particle, wherein said standard results are obtained by generating a radiation scattering pattern capable of uniquely identifying said previously identified particle, and identifying said unknown particle based upon the comparison step.

29. The apparatus of claim 28 wherein the radiation scattering pattern capable of uniquely identifying said previously identified particle was generated by subjecting measurements of the radiation scattered by said previously identified particle in a fluid to an algorithm which enhances the separation of data generated from said measurements from data generated from measurements of distinct particles.

30. The apparatus of claim 29 wherein said algorithm is multiple analysis of variance.

31. The apparatus of claim 29 wherein the radiation scattering pattern capable of uniquely identifying said previously identified particle was generated by further subjecting the data obtained from said algorithm to a mathematical technique that further enhances the separation of data generated from said measurements from data generated from said measurements of distinct particles.

32. The apparatus of claim 31 wherein said mathematical technique eliminates the data generated from a selected, previously identified particle unless the selected, previously identified particle is of the same type as the **N** particles whose generated data is most similar to the selected, previously identified particle's data, where **N** is a whole number greater than 0.

33. The apparatus of claim 28 wherein the source of radiation is a source of electromagnetic radiation.

34. The apparatus of claim 33 wherein the source of electromagnetic radiation is a laser.

35. The apparatus of claim 34 wherein the detection means comprises a plurality of photodetectors and a computer operatively connected to said photodetectors.

10030804 .254256